

### EXERCISE 2.5

1. Use suitable identities to find the following products:
  - (i)  $(x+4)(x+10)$
  - (ii)  $(x+8)(x-10)$
  - (iii)  $(3x+4)(3x-5)$
  - (iv)  $(y^2 + \frac{3}{2})(y^2 - \frac{3}{2})$
  - (v)  $(3-2x)(3+2x)$
2. Evaluate the following products without multiplying directly:
  - (i)  $103 \times 107$
  - (ii)  $95 \times 96$
  - (iii)  $104 \times 96$
3. Factorise the following using appropriate identities:
  - (i)  $9x^2 + 6xy + y^2$
  - (ii)  $4y^2 - 4y + 1$
  - (iii)  $x^2 - \frac{y^2}{100}$

4. Expand each of the following, using suitable identities:
  - (i)  $(x+2y+4z)^2$
  - (ii)  $(2x-y+z)^2$
  - (iii)  $(-2x+3y+2z)^2$
  - (iv)  $(3a-7b-c)^2$
  - (v)  $(-2x+5y-3z)^2$
  - (vi)  $\left[\frac{1}{4}a - \frac{1}{2}b + 1\right]^2$
5. Factorise:
  - (i)  $4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz$
  - (ii)  $2x^2 + y^2 + 8z^2 - 2\sqrt{2}xy + 4\sqrt{2}yz - 8xz$
6. Write the following cubes in expanded form:
  - (i)  $(2x+1)^3$
  - (ii)  $(2a-3b)^3$
  - (iii)  $\left[\frac{3}{2}x+1\right]^3$
  - (iv)  $\left[x - \frac{2}{3}y\right]^3$
7. Evaluate the following using suitable identities:
  - (i)  $(99)^3$
  - (ii)  $(102)^3$
  - (iii)  $(998)^3$
8. Factorise each of the following:
  - (i)  $8a^3 + b^3 + 12a^2b + 6ab^2$
  - (ii)  $8a^3 - b^3 - 12a^2b + 6ab^2$
  - (iii)  $27 - 125a^3 - 135a + 225a^2$
  - (iv)  $64a^3 - 27b^3 - 144a^2b + 108ab^2$
  - (v)  $27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p$
9. Verify: (i)  $x^3 + y^3 = (x+y)(x^2 - xy + y^2)$       (ii)  $x^3 - y^3 = (x-y)(x^2 + xy + y^2)$
10. Factorise each of the following:
  - (i)  $27y^3 + 125z^3$
  - (ii)  $64m^3 - 343n^3$

[Hint : See Question 9.]
11. Factorise :  $27x^3 + y^3 + z^3 - 9xyz$
12. Verify that  $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x+y+z)[(x-y)^2 + (y-z)^2 + (z-x)^2]$
13. If  $x+y+z=0$ , show that  $x^3 + y^3 + z^3 = 3xyz$ .
14. Without actually calculating the cubes, find the value of each of the following:
  - (i)  $(-12)^3 + (7)^3 + (5)^3$
  - (ii)  $(28)^3 + (-15)^3 + (-13)^3$
15. Give possible expressions for the length and breadth of each of the following rectangles, in which their areas are given:

Area :  $25a^2 - 35a + 12$

(i)

Area :  $35y^2 + 13y - 12$

(ii)